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Spatiotemporal transmission and clustering of enterovirus 71 subgenotype B5 in Taiwan, 2007–2012

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Background: EV71 infection has been a recognized public health threat in Taiwan since the 1998 large-scale nationwide outbreak. Previous studies reported clusters of EV71 infection shifted northward from south Taiwan in 1999–2005. The EV71 subgenotype B5 was first found in Taiwan in 2007 and phylogenetic analyses showed the circulation of two B5 strains (groups A and B) through 2012. The study objective is to describe the origins and detect clusters of groups A and B B5 strains.

Methods & Materials: The Sentinel Laboratory Network for Enterovirus Surveillance collects clinical specimens for enterovirus isolation from patients with herpangina or hand, foot, and mouth diseases. We included all patients with laboratory-confirmed EV71 B5 subgenotype infection from October 2007 through December 2012 (n = 1523). Residences of case-patients were geocoded by ArcGIS and analyzed by the space-time permutation model of SaTScan to detect clusters.

Results: Descriptive analyses showed that group A B5 infection originated from south Taiwan in October 2007, spread northward to islandwide, and in February 2010, ended in north Taiwan. Group B B5 infection originated from the same terminal county of group A B5 strains in north Taiwan in June 2010, spread along the southwest direction, and subsequently, made their way to east Taiwan. The space-time permutation scan statistics identified 6 clusters of EV71 B5 subgenotype infection; 4 were group A in central (n = 10, radius 3.04 km, p = 0.018), south (n = 5, radius 8.39 km, p = 0.043), and north (n = 9, radius 4.51 km, p = 0.001; n = 7, radius 3.16 km, p = 0.001) Taiwan and 2 were group B in south Taiwan (n = 6, radius 5.38 km, p = 0.001; n = 37, radius 9.91 km, p = 0.001).

Conclusion: Transmission of EV71 subgenotype B5 has no consistent spatiotemporal pattern. The southwest seeding and clustering of group B B5 strains in south Taiwan might be the results of increasing population susceptibility due to nonimmuned birth cohorts and waning cross-immunity to prior group A B5 infection. We recommended further studies to identify risk factors for the origins and clusters of EV71 B5 subgenotype.

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Vital signs in elderly dengue patients: Trends of blood pressure and pulse rate

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Background: Dengue in elderly is increasingly common. Blood pressure (BP) and pulse rate (PR) are important vital signs, however, there is no large-scale study reporting daily trend in dengue patients. We aim to examine the trend of BP and PR in elderly dengue patients.

Methods & Materials: All adult dengue, confirmed by PCR or serology, admitted to Tan Tock Seng Hospital, Singapore from year 2005-2008 were included. Elderly was defined as age >60 years. comparisons were made between elderly and non-elderly cohorts (controls) for systolic and diastolic BP (SBP and DBP), pulse pressure (PP) and PR during hospitalization. Febrile, critical, early and late recovery phases were defined as illness day 1-3, 4-7, 8-11 and 12-15. Time trend analyses by illness day and defervescence day (DD) were done by Markov model.

Results: Among 6070 confirmed dengue inpatients, there were 296 (4.87%) elderly, 64.7% males, 71.3% Chinese, 8% with hypertension, 26.3% DHF and 0.31% managed in intensive care/death. Median illness on hospital admission was 5 days (5th-95th quantile: 3 to 7). Mean SBP, DBP, PP and PR readings on admission between elderly cohort and controls were 117 vs 106, 65 vs 62, 47 vs 40, 86 vs 92, respectively. Elderly cohort had consistently higher mean BP readings (SBP, DBP and PP) than controls at any point of illness. BP readings showed similar downward trend in febrile phase for both cohorts. During critical phase, higher rate of decrease in BP readings were found in controls. During early recovery phase, similar upward BP trends were observed in both cohorts till normalization. All BP readings were lowest on DD, with similar downward and upward trends 3 days before and after DD. In terms of PP, though elderly cohort went through relatively unchanged course, controls had steep downward trend until it reached lower PP at normalization than elderly cohort. The PP trend crossover between elderly and controls took place one day after DD.

Conclusion: Overall, elderly cohort had higher BP readings than non-elderly cohort throughout hospitalization. BP turned around after day 7 of illness or day 1 after defervescence. More stable PR readings were observed in elderly cohort.

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